An Introduction to Washington’s Water Quality Assessment

for the
Spokane River Regional Toxics Task Force
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Need for an Assessment

- The federal Clean Water Act, adopted in 1972, requires that all states restore their waters to be “fishable and swimmable.”

- Section 303(d) of the Clean Water Act established a process to identify and clean up polluted waters.

- States required to do water quality assessment every two years of surface waters in the state where data were available.

- The assessed waters are placed in categories that describe the status of water quality.
Water Quality Assessment and 303(d) List

The federal Clean Water Act, adopted in 1972, requires that all states restore their waters to be "fishable and swimmable." Washington's Water Quality Assessment lists the water quality status for water bodies in the state. This assessment meets the federal requirements for an integrated report under Sections 303(d) and 305(b) of the Clean Water Act.

The assessed waters are grouped into categories that describe the status of water quality. The 303(d) list comprises those waters that are in the polluted water category, for which beneficial uses—such as drinking, recreation, aquatic habitat, and industrial use—are impaired by pollution.

- **Introduction to the Water Quality Assessment and 303(d) List**

- **Assessments**
  - **Current EPA-Approved Assessment:**
    - [EPA-approved marine assessment and 303(d) list](#)
    - Approved December 21, 2012
  - **Proposed Assessment:**
    - [Freshwater Water Quality Assessment and 303(d) List](#)
    - In progress as of January 2013

- **Differences between the current and past 303(d) Lists**

- **Categories**
  - [Water Quality Assessment Categories](#)
  - [Examples of local water quality improvement efforts](#)
    - [Category 4b: Pollution Control Programs other than TMDLs](#)
    - [Category 5: Water Quality Improvement Projects (TMDLs)](#)

- **Program Policies that Apply to the Integrated Report**
  - [Water Quality Policy 1-11: Ensuring Credible Water Quality Data for Management and the Assessment Report](#) (Chapters 1 and 2)

- **Related Links**
- [For more information](#)
The Water Quality Assessment

- WQA guided by federal laws, state water quality standards, and Ecology policy for the assessment

- Water Quality Program Policy 1-11 describes how the standards are applied, requirements for the data used, how to prioritize TMDLs, and issues

- Goals: make best possible decisions about status of waters as related to meeting standards
Water Quality Program Policy 1-11

- Chapter 1: Assessment of Water Quality for the Clean Water Act Sections 303(d) and 305(b) Integrated Report

- Chapter 2: Ensuring Credible Data for Water Quality Management
Overview of WQA Process

- Call for Data
- Data compilation and screening
- Assessment
- Public Review
  - Workshops
  - Responsiveness Summary
- Submittal to EPA: review and approval
- Approved WQA available on web
Water Quality Assessment Categories

- Category 1 - Meets tested standards
- Category 2 - Waters of concern
- Category 3 - Insufficient data
- Category 4 - Polluted waters (TMDL in place)
- Category 5 - Polluted waters: the “303(d) list” (TMDL required)
Water Quality Standards for Surface Waters of the State of Washington

- Chapter 173-201A WAC, 2006
- Protect beneficial uses:
  - Human health
  - Fishing
  - Swimming
  - Aquatic life
- Human health water quality standards contained in the National Toxics Rule, 1992 (40 CFR 131.36)
Surface Water Quality Standards

Rule Revisions
Approved Surface Water Quality Standards: Learn more about the rule activity documents and timeline for the surface water quality standards most recently approved by the Environmental Protection Agency.

Current Rule Activities: Learn more about potential changes to the surface water quality standards.

Archival Rule Documents: Learn more about rule activity documents and timeline related to archival rule-making.

Overview: Learn more about the Surface Water Quality Standards and how they interact with the waters of Washington State.

Designated uses: Learn more about how designated uses have sometimes been called "beneficial uses" and include public water supply, protection for fish, shellfish, and wildlife, as well as recreational, agricultural, industrial, navigational and aesthetic purposes.

Surface water criteria: Learn more about fresh and marine water quality criteria developed to provide protection for designated uses.

Antidegradation: Learn more about how the surface water quality standards help prevent unnecessary lowering of water quality, and provide a framework to identify those waters that are designated as an “outstanding resource” by the state.

Other Information
Triennial Review: Learn more about how the Triennial Review provides an opportunity to discuss the priorities and commitments the agency makes with EPA and others regarding the surface water quality standards.

State Programs that Implement the Standards: Learn more about other state programs that implement the surface water quality standards.

Related Information: Learn more about other information related to the surface water quality standards.
National Toxics Rule

- Criteria for 85 chemicals
- Carcinogens and non-carcinogens
- Human Health criteria based on assumptions from 1990’s:
  - Drinking water 2 liters per day (~ 2 qts)
  - Average body weight 70 kg (~ 154 lbs.)
  - Fish consumption rate 6.5 g/day (~ 0.23 oz/day)
  - Risk level for carcinogens of one-in-one million
  - Exposure period of 70 years
- Criteria are expressed as concentrations in water
Measuring Pollutants in Water

- Current analytical methods for many pollutants in water are inadequate: reporting limits are too high

- Alternative: concentrate and measure the chemical of interest, then calculate the corresponding water concentration

- Concentration methods: fish tissue, SPMDs, other adsorption media like SPE disks, resin columns.
Fish Tissue Equivalent Concentration (FTEC)

- FTEC representative of concentration in water
- FTEC used in WQA: is threshold for 303(d) listing

FTEC determined by: \( Ct = BCF \times Cw \)
- \( Ct \) = Concentration in tissue
- \( BCF \) = Bio-concentration Factor (31,200 for PCBs)
- \( Cw \) = Human health water quality criterion for water (0.000 170 ppb for PCBs)

- FTEC for PCBs is 5.3 ppb
Assessment of Sample Results

- Compile data
- Ensure data meets requirements of the *Water Quality Data Act (RCW 90.48.570-590).*
- Organize data:
  - Locations
  - Timeframes
  - Sample characteristics
  - Pollutants measured
  - Analytical methods
- Compare sample results to WQS
- Assign Category to waterbody that was sampled
Fish Tissue Data

- Compare fish tissue concentrations to FTEC

- If sample result > FTEC, sample exceeds WQS and waterbody placed in Category 5

- If sample result < or = FTEC, sample meets WQS and waterbody placed in Category 1

- Waterbody placed in other Category if certain conditions encountered
Figure 1. Fish sampling locations on the Spokane River, 2012.
Mean values with 95% confidence intervals for PCBs in Spokane River fish (whole and fillet), 2012

WA FTEC = 5.3 ug/kg
## Sites & species not meeting Washington’s WQ Standards.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total PCBs</th>
<th>2,3,7,8-TCDD</th>
<th>2,3,7,8-TCDD TEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spokane River, Plante Ferry (PF)</td>
<td>NPM, RBT</td>
<td></td>
<td>NPM, RBT</td>
</tr>
<tr>
<td>Spokane River, Mission Park (MP)</td>
<td>MWF, RBT</td>
<td>MWF</td>
<td>MWF, RBT</td>
</tr>
<tr>
<td>Spokane River, Ninemile (NM)</td>
<td>MWF, RBT</td>
<td>MWF</td>
<td>MWF, RBT</td>
</tr>
<tr>
<td>Spokane River, Upper Lake (UL)</td>
<td>NPM, RBT</td>
<td>MWF</td>
<td>MWF</td>
</tr>
<tr>
<td>Spokane River, Little Falls (LF)</td>
<td>NPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Roosevelt, Spokane Arm (SA)</td>
<td>BNT, RBT</td>
<td></td>
<td>BNT, RBT</td>
</tr>
<tr>
<td><strong>Recommended Category for Water Quality Assessment:</strong></td>
<td><strong>5</strong></td>
<td><strong>2</strong></td>
<td></td>
</tr>
</tbody>
</table>
Cumulative Frequency Distribution of PCBs in Fish from Washington

- 2001-2012 statewide
- Spokane River 2012

- EPA SV Recreational Fishers (20 ug/kg)
- EPA SV Subsistence Fishers (2.45 ug/kg)
- Washington FTEC (5.3 ug/kg)
Additional Resources

- Water Quality Assessment and 303(d) List:

- Reducing Toxics in Fish, Sediments, and Water:
  - [http://www.ecy.wa.gov/toxics/fish.html](http://www.ecy.wa.gov/toxics/fish.html)

- Public Workshops: Reducing Toxics - meeting information

- Policy Forums on Human Health based Water Quality Standards - meeting information:

- Ecology - Fish Tissue Monitoring: Keith Seiders, 360-407-6689
  - Keith.Seiders@ecy.wa.gov; [http://www.ecy.wa.gov/programs/eap/toxics/wstmp.html](http://www.ecy.wa.gov/programs/eap/toxics/wstmp.html)